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THE STANDARD OF VALUE AND PRICES

There is no mistaking a general uneasiness concerning the alleged financial and commercial insecurity. The wave of apprehension is already sufficiently broad to have brought about an agitation for currency reform which promises an early digression from the nation's financial traditions and legislative experience. Divers currency schemes are being widely promulgated, and there is little doubt that, in the event of the repetition of recent extraordinary symptoms of the money market, or the realization of a panic pressure in financial and commercial circles such as is being so generally prophesied, there will be precipitated an imperative demand for more or less radical currency legislation.

The experience of the United States with ill-advised currency laws has been such as to make salutary a clarifying of the public mind upon the action of the price-making forces and a more general understanding of the principles underlying exchange; especially is this true in view of the present anticipation of legislative action upon currency questions.

Discussion pertinent to prices and financial legislation tends to center about the so-called quantitative theory of prices. The validity of this theory has for some time been under indictment, but the case is not yet rested. The critics of the doctrine have based their arguments upon two premises; i. e., that the theory fails to take into consideration fundamental factors active in the determination of prices, and that the laws deduced therefrom fail to explain certain important price phenomena within common recollection.

Although many doctrinaires remain entrenched in the imagined security of the time-established theory that the quantity of the circulating medium is a criterion of prices, there is a very general recasting of opinion as to the actualities of the price-forming process. Among those who contend for the preservation of the outlines of the old doctrine, there are few who have

not come to acknowledge forces in the determination of prices and price-levels which cannot be identified with the relativity of the amount of money in use and the gross of commodities in the process of exchange.

The proposed amendments providing for the introduction of new factors into the old formula are in great variety. Some wish to multiply the number of money units by an indeterminable factor representing the rapidity of circulation, and likewise to modify the number of commodities by a function of the number of exchanges in passing from extractive producer to consumer. While some would consider only money of final redemption, others would include treasury and bank notes, others the various forms of bank currency, and still others would add to these all forms of commercial credits. On the demand side, some would measure the money medium against the aggregate of commodities produced, others against commodities upon the market, and some would consider only goods sold for cash.

Mr. E. W. Kemmerer¹ has developed a formula, which fairly illustrates the present intangible contentions of the supporters of the quantitative theory:

M represents total number of money units.

R " average rate of circulation of money units.

N " total number of commodities for exchange.

E " average rate of exchange of commodities.

P " average price of all commodities exchanged.

C " checks used in exchange.

Rc " average rate of circulation of checks.

$$P = \frac{MR + CRc}{NE}.$$

Mr. Maurice L. Muhleman, a confessed supporter of the quantitative theory, virtually acknowledges the uselessness of the theory, as couched in any formula, by pointing out the necessarily indeterminable factors which defy solution.² Not infrequently such thinkers as Henry Farquhar have expressed themselves as admitting a truth in the theory, provided, "other things remain equal," but directly deny that other things do remain

¹ *Moody's Magazine*, September, 1906.

² *Ibid.*

equal since, under normal circumstances, "numerous forms of barter may interfere and prices are largely psychological."

Professor Fisher,³ after a broadly qualified support of the quantitative theory, concludes that, "in short, prices in gold countries depend chiefly on the amount of business and the amount of gold." Now, it is difficult for the legislator and the business man to see an identity in the amount of gold and the quantity of money, and they justly demand a more tangible reason for the indiscriminate use of these terms than has yet been advanced.

Under the quantitative theory, as formerly promulgated, one had the satisfaction of working with a formula which, granting its hypothesis, rendered a finite result through the use of finite factors. By virtue of the enrichments of the same theory, the legislator is now presented with a price equation, composed largely of indeterminable quantities, by the solution of which he is expected to reach finite conclusions concerning the relativity of the currency and commerce, and to embody these conclusions in beneficent law.

On the other hand, the quantitative theory is being attacked by those who decline to point out any inherent defect, but base their criticism upon its obvious failure to explain price movements, and who are unable to supplant it by any defensible principle of price relations. In this class we find Mr. Albert S. Bolles, who, in the January issue of this *Journal*, flatly denounces the quantitative theory, and goes a step farther than economists who have previously attempted to reveal fallacies in the doctrine. Mr. Bolles frames his conclusions in the following paragraph:

Lastly, the increase in the gold supply has no more effect in explaining business and rising prices than a thunder shower would have in raising the level of the Atlantic. Prices rise and fall every day, week, and month, and yet the volume of the currency, including the supply of gold, is constantly advancing. The fluctuations vary greatly, but of late years there has been a strong general tendency upward; yet sooner or later the unwelcome visitation of a business depression will come with a decline in prices, just as surely as if not a single dollar had been added to the world's gold supply.

To this unqualified abrogation of any possible relation between the volume of any element of the currency and the average of

³ *Loc. cit.*

prevailing prices, Mr. Bolles adds a cursory examination of relations of prices, commercial credits, and interest rates, and closes his discussion without any hint as to the solution of the query which he first raised.

A conviction that the quantitative theory of prices is fallacious forces itself upon one who thoroughly examines the course of prices and the characteristics of the currency from the advent of the Civil War to the present. The period is first characterized by an epoch of wildly fluctuating and uncertain prices, followed, after 1872, by a firm decline until 1897, and, thereafter, by a rapid rise. Carefully prepared trade and financial statistics are available for this period alone of our entire financial history. These statistics, the only reliable evidence attainable upon the validity of the quantitative theory, fail absolutely to establish even an obscure relation between prices and the supply of the medium of exchange, or any major element thereof, whereby the latter may be said to be a determinant of price-levels.

On the other hand, a comparative examination of the movement of price averages and of the visible gold supply and rate of production (irrespective of the amount of money in circulation) at once suggests an intimate relationship. In support of this thesis, it is shown by the United States mint reports that during the twenty years of falling prices following 1870, the world's annual output of gold was augmented by only 10 per cent. Assuming the average annual increase during twenty years preceding 1870 to be a normal rate, it appears that this rate was thereafter not again attained until 1892, and the deficit in the world's supply caused by the declining rate was not made up until 1896 (see diagram). In the meantime the population, industry, and commerce of the civilized world were rapidly expanding and necessarily met the decreasing supply of new gold with a constantly accelerating demand. The annual output of gold in the United States decreased from 50 millions, in 1870, to 33 millions, in 1890, and permanently reattained the former record in 1896. During this period of twenty-five years the average annual production was only 35 millions. Dun's index numbers show an increase in price averages in the United States

of 28.34 between January 1, 1897, and November 1, 1905, and the numbers of the Bureau of Labor show a rise of 25.3 to January 1, 1905. During this period the increase in the world's visible supply of gold was 30 per cent. (\$1,555,100,000). Since January 1, 1905, both the output of gold and the rise of prices have been greatly accelerated. In fact, the general rise of price levels in Europe and America may be shown to be reasonably proportional to the contemporary increase in the output of gold from the mines of the Transvaal, Australia, Alaska, California, and the Rocky Mountain states, diminished by certain demands for extraordinary consumption.⁴

The price-making process is itself simple, but it is to be borne in mind that the consummation of exchanges and the function of the money medium in relation thereto are considerations quite apart from price-determination.

PERCENTAGE RELATION OF ANNUAL INCREASE IN VISIBLE SUPPLY OF GOLD 1870 TO 1905, TO NORMAL INCREASE, COMPARED WITH CONTEMPORARY PRICE AVERAGE

Year	Per cent. of Normal Increase	Index No. of Prices	Year	Per cent. of Normal Increase	Index No. of Prices
1870.....	97	119	1889.....	89	98
1871.....	85	123	1890.....	85	94
1872.....	85	121	1891.....	95	98
1873.....	69	114	*1892.....	103	90
1874.....	48	117	1893.....	102	94
1875.....	70	115	1894.....	106	86
1876.....	75	109	1895.....	257	81
1877.....	84	107	1896.....	190	78
1878.....	88	103	†1897.....	385	76
1879.....	79	95	1898.....	196	80
1880.....	77	105	1899.....	370	80
1881.....	74	108	1900.....	270	95
1882.....	88	109	1901.....	275	96
1883.....	67	107	1902.....	340	102
1884.....	72	103	1903.....	400	100
1885.....	77	93	1904.....	380	100
1886.....	75	93	1905.....	490	100
1887.....	75	94	1905, Nov. 1.....	...	104
1888.....	77	96

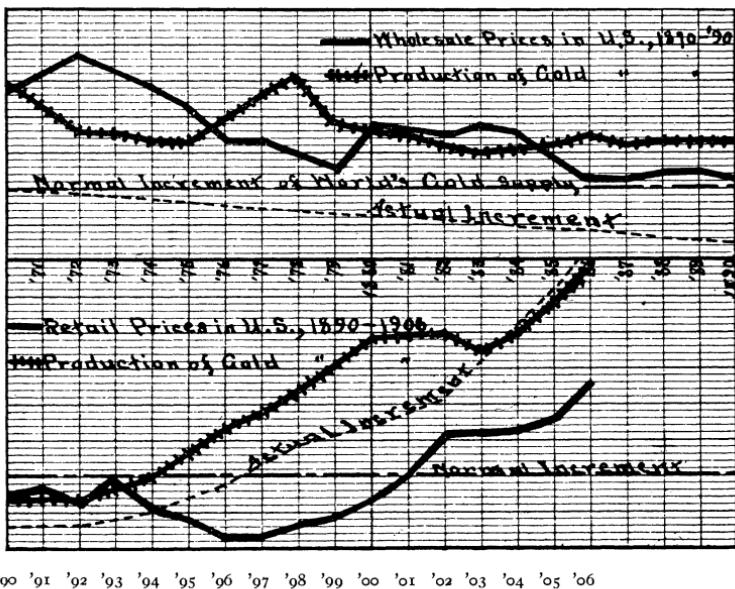
*First year of normal production after 1870.

†End of falling prices and first year following balancing of deficit.

⁴ Fancis B. Forbes, "The World's Recent Production of Gold and Its Influence upon Commodity Prices," *Quarterly Publication of the American Statistical Association*, June, 1906.

The accompanying diagram and table are subject to the usual inaccuracies of price and production statistics. They have, however, suggestive merit and reveal a noteworthy relation between accessible measures of price-changes and gold production and supply.

The diagram covers the period 1870 to 1907, the curves being broken at 1890. A general correspondence of the price curve with the gold lines is apparent, especially with the accumulative curve representing the variation of the actual annual increment of the world's visible supply from the normal increment, the latter being based upon the increase for twenty years prior to 1870. When the curves are smoothed or five-year averages are taken instead of annual averages, the correspondence is much more marked.



Several periods of short duration show the curves following independent courses. These periods, however, were subject to certain extraordinary influences upon both commerce and industry, and consequently upon commodity prices and gold production. A period of uncertain currency policy and industrial confusion sent food prices skyward in 1870, and, at the same time, suddenly discouraged the production of the precious metals. By 1875 the gold and silver industries, previously amalgamated, were somewhat segregated, and the epoch of resumption stimulated the production of gold by an abnormal demand and simultaneously forced the speculative increment out of greenback prices. The exceptional decline of prices incident to the panic of 1893 requires no explanation.

Statistics of gold production were taken from the U. S. mint reports, and the annual increments in the world's visible supply were derived from the estimates of *Moody's Magazine*, Vol. I, p. 17. The Aldrich index numbers were used for the period 1870 to 1890, and the retail numbers of the Labor Bureau were used for the remaining period. In the table, Dun's numbers are used for the latter period because of their ready articulation with the Aldrich numbers.

A unit of any commodity on the market has a value in exchange—the ratio of its unit marginal utility to like utilities of other commodities.⁵ This value, of course, may be expressed in as many different ratios as there are commodities available for exchange. For example, the value of a measure of hay expressed in its market relation to respective measures of potatoes, gloves, or gold appears as 1:0.1, 8:1.6, or 8:1; that is to say, it exchanges for ten units of potatoes, five units of gloves, or eight units of gold. This process, likewise, gives us the ratio-measures of the respective values of all other commodities in terms of the one (hay), and these may be called their *rates of exchange*.

The selection of a single commodity in order to standardize the value-ratios or rates of exchange of all commodities constitutes the naming of a *standard of value*. All exchange rates being thereafter expressed in terms of the standard commodity, values become comparable, and positively defined *prices* emerge.

The process above described is precisely what has taken place before a single transaction is executed on any market. A standard commodity has in each instance been selected with regard to its characteristic desirability, durability, and high and stable marginal utility. In colonial Virginia this standard was tobacco, in the Hudson Bay country it was beaver pelts, in Spanish America it was silver, and in commercial countries of the present it is gold. In the United States an arbitrary weight of gold has been designated, and for traditional reasons called a dollar. This weight of gold thus becomes a measure of value. Its power in exchange is not constant, but, as does that of any other commodity, fluctuates directly as its ability to satisfy effective demands for mechanical purposes, for ornamental uses, and for absorbing and storing value. The only factors of the

⁵ Marginal utility is here used as the fundamental concept of value. There is, however, no objection to the use of the normal cost of production as a measure of value in this discussion. Cost of production does not fix values, but itself is determined by values as established by marginal utilities. Marginal utility, value, and cost of production, therefore, being successively related as cause and effect are directly proportional or are of equivalent degree. Normal cost of production is comparatively easily measured and becomes a convenient criterion of marginal utility and value.

standard's power in exchange, therefore, are the available supply of the metal and the gross magnitude of the effective wants for its services. These wants make themselves felt by the proffer of goods in exchange for gold or its representatives, and the ratios of the property units actually thus exchanged establish price numbers in terms of dollars and cents.

Prices, in all of their essential features, depend upon the ratios of the value of gold to the value of each other commodity on the market, and the value of any commodity is the resultant of its available supply measured against the effective demand for its services. This proposition involves no consideration of the special service of the standard commodity as a medium of exchange; prices being determined, the exchange of commodities will readily proceed without any considerable participation of the standard in the process. Values will always rest upon a basis of comparative utilities, and exchange will proceed with values and prices unaffected by transformed methods of barter, changing elements and volume of the medium of exchange, or the manner and degree of the development of the credit system. In these price relations we recognize the function of a standard of value, and, as a result of the value-measuring process, a scale of prices based upon comparative utilities and expressed in terms of the standard of value will emerge. This process is in itself complete, and through it actual price-levels are realized and maintained quite independently of any instrumentality or mechanism of exchange.

A second monetary function, that which has monopolized the attention of most thinkers upon currency questions, is the medium of exchange. Exchange values being established, an accurate, safe, and convenient instrumentality becomes necessary by means of which exchange of unequal values, transactions, involving considerable time, borrowing, lending, and hoarding of value may be facilitated. However, the fact has been very generally overlooked that the organism known as money was called into being and is maintained for the purpose of two distinct functions and itself consists of two distinct factors. These two factors or elements of the monetary organism have been con-

fused as to characteristics, and their respective functions of fixing prices and facilitating exchanges have not been properly differentiated.

It is here that Professor Joseph French Johnson has erred in his recent book. Money is defined as consisting exclusively of gold,⁶ but is frequently treated as inclusive of all coins and redeemable and fiat paper money as well. In his second chapter, Professor Johnson repeatedly states that "money's one function is to serve as a medium of exchange;" however, this function appears so variable in its nature as to receive treatment under the separate headings "A Standard of Prices" and "A Store of Value." Credit is not included in the medium of exchange, but is deemed to have a direct influence upon price in proportion to its volume. Nominally, contending for a quantitative theory of prices which would make prices fluctuate in direct proportion to the aggregate volume of currency and credit,⁷ Professor Johnson's arguments and illustrations, with few exceptions, lend themselves to the support of the *relative utility* principle instead.⁸ His illustrations have, in each case, assumed an increase in the

⁶ Johnson, *Money and Credit*, pp. 6, 350.

⁷ *Ibid.*, pp. 57, 58.

⁸ "If, for instance, the money of a country were increased 50 per cent. during a period of five years and no changes were made in the supply for another five years the price-level at the end of the ten years assuming that the readjustment of prices was then complete, would be 50 per cent. higher than it would have been if the supply of money had not been increased." (*Ibid.*, p. 129.)

Professor Johnson bases his arguments in support of the quantitative theory upon suppositions of which the following are typical: "Let us suppose that the supply of money in the United States has been greatly increased during a certain month by an influx of new gold from the mines of Alaska, California, and Colorado." (*Ibid.* p. 113.) "Let us suppose that a Connecticut farmer discovers in a cave on his farm the storied treasure of Captain Kidd in the shape of 5,000,000 ounces of gold (enough to coin \$100,000,000)." (*Ibid.*, p. 124.)

On p. 125 an idea is developed portraying the expansion of bank credit, as based upon the discovered treasure of Captain Kidd, and to this credit is attributed an influence in raising prices. The author seems not to comprehend the fact that the discovery of an equivalent value of diamonds or of baled cotton might reasonably have furnished the basis for an equal expansion of credit, and his argument would not assign to these credit instruments, although they would be identical in form and use with the first, any influence in raising prices. In fact, he cannot well deny that in the latter incident there would appear a cause of falling prices.

supply of gold, and he has reasoned therefrom to a conclusion of increased prices. This course of reasoning is perfectly logical; but an increase in the supply of gold may be something quite apart from an increase in the volume of the currency, and an expanded currency does not necessarily involve an increased supply of gold.

It is the confusion of the respective functions of a standard of value and a medium of exchange that gives rise to the chief errors of the quantity theorists, and likewise leads to the indefensible, though opposing, declaration of Mr. Bolles.

Admitting that the psychological factors of bargaining and custom may carry market prices slightly above or below normal prices, the fundamental principle of price-determination is simple and positive. The magnitudes of prices in terms of dollars, and of price-levels in terms of index numbers, vary directly with the ratio of the total supply of the standard metal to the total supply of other economic goods, each member being modified by the actual consumption or service needs of the community; and for this reason, the partial or supplementary element, known as the medium of exchange, does not command independent consideration and does not establish or control prices. The utilities of the medium of exchange are entirely different in kind from those of a standard of value, and likewise their economic relations are entirely distinct. The medium of exchange, in the gross, comprehends not only the entire money medium, but all forms of credit currency as well. It expands and contracts automatically, within wide but certain limits, in accordance with the needs of trade.

It is argued that the chief utility of the standard metal arises out of its function as a medium of exchange, since it happens to compose one of the several elements of the currency. While this point, if established, would not invalidate the above reasoning as to the actualities of price-determination, the basis of the contention may well be questioned.⁹

⁹ Mulhall, in the *Dictionary of Statistics*, estimated the visible supply of gold in 1896 to be about $6\frac{1}{4}$ billions of dollars, three-fifths of which he estimated to have been coined. Since that time the visible supply has probably increased to near 8 billions. The conclusion that, three-fifths of the gold having

Only a doubtful proportion of the total gold product finds place in the currency medium and the remaining volume takes its way through the marts of trade and into the hands of consumers as an unostentatious commodity free from any specific attribute as an instrumentality of exchange. Much of the gold involved in international trade is entitled to no attribute in exchange distinguishable from contemporary shipments of cotton and farm machinery—each contributes a like entry upon the balance-sheet of commerce. The millions of gold reported to have recently found place in the war-chests of Europe are stored as value for future services as truly as is the wheat in the elevators of the Northwest and the cotton goods in the warehouses of New England. There are those who persist in calling such gold "money," and who assign to it a specific and dominant utility as a medium of exchange, while in their reasoning the wheat and the cotton remain merely economic goods.

It may not be denied that the standard commodity acquires an increment of utility because of its secondary function as a

been coined, that proportion of the total supply is used as a medium of exchange is erroneous. The mints offer the most accessible avenue for the distribution of new gold, and usually refine and coin it at a nominal charge. For this reason they gather, refine, and coin much gold which never realizes the utility of a medium of exchange, but is quickly acquired by the goldsmith, the exporter, or the reserve agent. This metal is entered upon the statistics of the mint as coin, but neither performs the functions of a medium of exchange nor for long retains the form of coin. Notwithstanding the fact that the United States mint reports show a total gold coinage since 1872 of nearly 2 billions of dollars, the latest report of the controller of the currency makes evident the fact that not more than 20 per cent. of this amount of gold coin is now available, and it is asserted upon authority that not more than 2 per cent. of the amount is in actual circulation in this country.

Although the United States is the world's greatest gold-producer (\$100,000,000 in 1906), the gold held by the Treasury as a basis of the national currency does not exceed \$800,000,000, and estimates of coin in the hands of the people which may rightly be said to perform the functions of a medium of exchange vary from \$3,000,000 to \$400,000,000, with the evidence favoring the former as approaching more nearly the truth. (Report of the controller of the currency, December, 1906; W. H. Allen, *Moody's Magazine*, April, 1907.) It is to be remembered in this connection that the total supply of money in the United States is reported to be over $3\frac{1}{4}$ billions of dollars, over three-quarters of which is in actual circulation, and also that the volume of the credit medium in constant use is several times greater.

medium of exchange; but the fluctuations in the value or final utility of the metal are not to be traced to this limited and stable increment, but rather to its primary utility as determined by its supply and demand as a mineral commodity and not as a money element. To these fluctuations alone may be traced the ebb and flow of price-levels.

The query arises: If the quantitative theory is fallacious, what, then, is the relation between the volume of the medium of exchange and other market factors? The reply is that market activities are reflected in the volume of the currency, which is automatically regulated by commercial forces to correspond with the needs of the market. Fluctuations in the aggregate of the *means of exchange* are directly proportional to changes in the total of commodity units in the process of exchange times their average price—prices being previously determined as explained above.

Again it is asked: How is the volume of money so readily adjusted to the needs of trade? In this connection it is to be remembered that money, as generally defined, comprises a very small proportion of the actual means of exchange in use at any time. Coins and authorized paper currency fall far below the minimum volume necessary for the consummation of trade under most stagnant market conditions. The so-called money medium is supplemented by several times its volume of credit instrumentalities. These credits take the form of book accounts, checks, drafts, bills of exchange, certificates of deposit, warehouse receipts, bonds, promissory notes, and even oral and implied obligations. Each acquires power in exchange because of the probability of its ultimate redemption in a measure of economic goods—either the standard commodity or other goods of equally positive worth. Each of the host of credit instrumentalities is called into being for the specific purpose of facilitating commercial transactions, and thus becomes a functionary of exchange and a part of the currency medium. The total volume of book credits, bank paper, personal obligations, etc., depends upon the aggregate of commodities in the process of exchange and the prices of these commodities, and, independently of cash considerations,

facilitates the exchange of goods. For this reason, what we call the *credit medium* at all times supplements the volume of the *money medium* in use, and their combined magnitudes are at all times equivalent to the needs of trade.

A manufacturer, finding himself without cash to liquidate his weekly pay-roll, places his personal note with collateral in the hands of his bank, and his account receives a deposit credit entry upon the books of the bank of \$1,000. The claims of his workmen are satisfied with checks drawn upon this account, and in turn the demands of the butcher and the grocer upon the workmen are as readily satisfied by the negotiation of these checks or the drawing of other checks against bank deposits created by the negotiation of the original checks. A second negotiation of checks and their distribution by the clearing-house transfers the original credit of the manufacturer to the bank accounts of the tradesmen, who, upon the purchase of a part of the week's output of the manufacturer and the remittance of checks against their respective accounts, place in his hands the means with which to redeem his note and, at the same time, reduces the accounts of the tradesmen to their original value. By this process, means of production are purchased, the product is passed from the producer, through the hands of the merchant, to the consumer, and the entire series of transactions is accomplished without the use of a cent of the authorized money medium. Obviously, \$1,000 cash could have been utilized to accomplish the same purpose, and doubtless would have been so used had it been convenient to the hand of the manufacturer. But its lack formed no obstacle to trade, and the credit medium at once expanded to meet the need and as readily contracted when the threefold transaction was accomplished. *The credit medium automatically expands and contracts to meet the needs of legitimate commerce, supplements perfectly any arbitrary volume of authorized currency, and forms a thoroughly elastic element of the medium of exchange.*

In conclusion, it is maintained that prices are expressed relations between values of respective units of market commodities and of the standard commodity, the relation being expressed in terms of the latter. Price-levels are affected only by shifting

relations among the four factors—demand and supply of the standard metal, and demand and supply of the aggregate of other goods. Gold is at the same time the standard of value and a determinant of prices. The medium of exchange is thoroughly elastic, and consists of a more or less flexible element known as money, and a highly flexible element comprehending all forms of commercial credits.

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